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Who Drinks Where: Youth Selection of Drinking Contexts

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Abstract

Background—Different drinkers may experience specific risks depending on where they consume alcohol. This longitudinal study examined drinking patterns, demographic and psychosocial characteristics associated with youth drinking in different contexts.

Methods—We used survey data from 665 past-year alcohol using youths (ages 13–16 at Wave 1) in 50 midsized California cities. Measures of drinking behaviors and drinking in seven contexts were obtained at three annual time points. Other characteristics included gender, age, race, parental education, weekly disposable income, general deviance, and past year cigarette smoking.

Results—Results of multilevel regression analyses show that more frequent past-year alcohol use was associated with an increased likelihood of drinking at parties and at someone else's home. Greater continued volumes of alcohol (i.e., heavier drinking) was associated with increased likelihood of drinking at parking lots or street corners. Deviance was positively associated with drinking in most contexts, and past year cigarette smoking was positively associated with drinking at beaches or parks and someone else's home. Age and deviance were positively associated with drinking in a greater number of contexts. The likelihood of youth drinking at parties and someone else's home increased over time, whereas the likelihood of drinking at parking lots/street corners decreased. Also, deviant youths progress to drinking in their own home, beaches or parks and restaurants/bars/nightclubs more rapidly.

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Conclusions—The contexts in which youths consume alcohol changes over time. These changes vary by individual characteristics. The redistribution of drinking contexts over the early life course may contribute to specific risks associated with different drinking contexts.

Keywords

youths; drinking contexts; self-selection; longitudinal study

Introduction

Research, primarily among adults and young adults college students, suggests the context in which drinking occurs may contribute to specific alcohol-related problems, such as aggression, risky sex and drinking and driving (Graham et al., 2002, Bersamin et al., 2012, Gruenewald and Ponicki, 2009, Walker et al., 2005). Self-selection of drinkers into different types of drinking contexts is one mechanism by which drinking contexts may contribute to alcohol use and alcohol related-problems (Gruenewald, 2007, Gruenewald et al., 2014). For example, if heavy drinkers frequent the same drinking contexts, they may reinforce each other's heavy drinking and problems associated with these contexts.

To date, little is known about selection of drinking contexts by young drinkers and the mechanisms that underlie the social ecology of drinking problems in this age group. Even less is known about how selection of drinking contexts changes as adolescents' transition into new developmental stages. The current study focuses on examining individual youth drinker characteristics associated with selection of different drinking contexts, and how these associations change over time. Understanding individual characteristics that contribute to selection of specific drinking contexts will provide a more comprehensive understanding of the mechanisms involved in drinking and drinking-related problems and can lead to additional tools and strategies that can be incorporated into context-based prevention programs.

According to a social ecological model introduced to explain the relationships between high density of alcohol outlets and alcohol-related problems among adults (Gruenewald, 2007, Gruenewald et al., 2014), two complementary social processes underlie individuals' self-selection into drinking contexts and the relationships between drinking contexts and alcohol-related problems. First, different drinking contexts may attract people with specific individual characteristics, creating unique niches for drinking ("niche theory"). For example, deviant youth may be more likely to choose less supervised drinking contexts (e.g., parking lots or street corners), while youth with lower levels of disposable income may be less likely to drink at on-premise outlets where alcohol costs more (e.g., restaurants or bars). Second, drinkers return to contexts in which they find people like themselves, possibly on the basis of their individual characteristics ("assortative drinking"). These processes may lead to the further stratification of drinkers across different drinking contexts and contribute to specific risks associated with these contexts. For example, greater concentrations of deviant youths in certain places may increase the likelihood of violence associated with drinking in those contexts. Similarly, frequent drinkers may self-select into contexts that provide easier access to alcohol from social sources such as parties. These frequent drinker youths may attend

multiple parties to obtain alcohol, which may increase the likelihood of driving after drinking. Little is known, however, about the impacts of these social processes upon drinking and problems among young people.

Previous studies have shown that certain individual characteristics are associated with youth alcohol use and drinking problems (Marshall, 2014). Research focusing on characteristics associated with *selection* of different drinking contexts among middle and high school-aged youths (13–18 years old), however, is limited to a few cross-sectional studies, some quite dated. For example, Harford and Spiegler found that older teenage males drank more often with peers outside the home, whereas teenage females drank more exclusively at home (Harford and Spiegler, 1983). They also found that certain personal attitudes and values (e.g., religiosity, academic expectations, peer compatibility) were associated with frequency of drinking in different settings (Harford and Grant, 1987). More recently, a study found that older youths who are heavier drinkers tend to drink in multiple contexts (Anderson and Brown, 2010). Another study indicated that males are more likely to report alcohol use in cars and high school-aged males are more likely than females to report alcohol use at school (Goncy and Mrug, 2013). All of these studies have explored cross-sectional relationships between youth drinking contexts and have included only a limited number of individual characteristics.

To understand the role of drinking contexts in alcohol-related problems, additional research is needed to examine a broader range of individual characteristics and changes in youth selection of drinking contexts across time. Important questions are: (1) what characteristics are associated with youth drinking in different contexts?; (2) how do youths change their drinking contexts during adolescence?; and (3) do specific youths progress to drinking in some contexts at different rates? To address these questions, the current longitudinal study assesses relationships of drinking patterns, demographic and psychosocial characteristics of youth drinkers with drinking in different contexts. By shedding light on who drinks where, this study takes a first step toward understanding potential dynamics that underlie the social ecology of drinking problems among youths and may support the development of context-based interventions to target specific youths and prevent alcohol use and related negative outcomes.

Materials and Methods

Study sample and survey methods

Sample of cities—The current study included youths who participated in three waves of a longitudinal study, conducted in 50 midsized California cities between 2009 and 2012, to examine the effects of existing local alcohol and tobacco policies on youth alcohol use and cigarette smoking. A geographically diverse sample of 50 non-contiguous California cities (population range: 50,000 to 500,000), designed to be representative of California cities of this size, was selected. While differences in some policies (e.g., implementation of social host ordinances) may affect where youths drink, such differences are part of naturally occurring variations that would be expected across communities and therefore do not limit generalizability of this study. Additional details of the procedures for sampling the cities are

described elsewhere (Lipperman-Kreda et al., 2012, Lipperman-Kreda et al., 2014, Paschall et al., 2014).

Survey methods and youth sample—The survey targeted adolescents who were 13–16 years old at Wave 1. Households within each of the 50 cities were randomly sampled from a purchased list of telephone numbers and addresses. Youths were surveyed at three annual time points, resulting in an age range of 13–19 years old across the three waves. At each wave, an invitation letter describing the study and inviting participation was mailed to sampled households followed by telephone contact. Interviewers obtained parental consent for the interviews followed by assent from the youth respondents. Respondents received \$25 at Waves 1 and 2 and \$35 at Wave 3 as compensation for their participation in the study. Institutional review board approval was obtained prior to implementation of the survey.

Youth were surveyed through a computer-assisted telephone interview (CATI). The interviews were given in either English or Spanish at the respondent's request and lasted approximately 30–40 minutes. Interviewers assured participating youths that their responses would be kept confidential and checked to be sure that the interview could not be overheard by anyone else in the household. The first wave of the survey took place in 2009. Of 3,062 sampled households with eligible respondents, 1,543 (50.4%) participated at Wave 1. Of these youth, 1,312 participated in the second telephone interview (Wave 2) one year later (85% follow-up) and 1,121 participated in the third telephone interview (Wave 3) two years later (85% of those participating at Wave 2).

The current study is based on data from 665 youths (56% male, M age at Wave 1 = 14.9 years, $SD = .95$) who (1) reported past-year alcohol consumption in at least one wave of data collection, (2) lived in the same city across study waves, and (3) provided complete data for all non-varying demographic measures (i.e., gender, age at Wave 1, race/ethnicity and parent education at Wave 1). Only two past-year alcohol using youths were excluded because of missing data for these demographic measures. Of the 665 participants, 79% ($N=524$) completed all three waves. 312 reported past-year alcohol use in one wave of data collection, 209 reported past-year alcohol use in two waves, and 144 reported past-year alcohol use in all three waves. Data from 289 past-year alcohol users were included in Wave 1, data from 402 past-year alcohol users were included in Wave 2, and data from 472 past-year alcohol users were included in Wave 3 (total $n=1,163$ observations). Overall, an average of 13 youths (range: 5–25, $SD=4.30$) in each city provided data for this study. Characteristics of cities, individuals, and observations are provided in Table 1.

Measures

Adolescent drinking patterns—Two measures of drinking patterns, frequency and continued volumes of use, were derived (Mair et al., 2013). Respondents to the youth survey were asked, “Have you ever had a whole drink (not just a sip or a taste) of an alcoholic beverage?” To measure past-year alcohol use frequency (F), respondents who answered “yes” were asked, “In the past 12 months, on how many days did you have a whole drink of an alcoholic beverage?” Respondents were also asked, “In the past 12 months, on the days when you drank alcohol, how many drinks did you typically have?” Continued volumes of

use was calculated as $[(F \times \text{typical number of drinks}) - F]$, representing the volume beyond one drink. Increased continued volumes, then, represents heavier drinking. These past-year alcohol use variables were scaled by dividing by 100.

Drinking contexts—Youths who reported past 12 month alcohol use were asked about the number of times they drank alcohol in seven distinct contexts. These included (1) parties, (2) someone else's home without parents, (3) own home without parents, (4) parking lots or street corners, (5) beaches or parks, (6) restaurant, bars or nightclubs and (7) school events. The distributions of drinking in these contexts are in Table 1. Based on the distributions of these outcome variables, drinking in one's own home, in parking lots or on street corners, at beaches or parks, in restaurants/bars/nightclubs, and at school events were treated as dichotomous variables. Drinking at parties and drinking at someone else's home were treated as count variables, as these were more frequently used contexts. Additionally, we created a variable of the number of types of drinking contexts youths reported using in the past year (range 0–7).

Weekly disposable income—Respondents were asked, "How much spending money do you receive or earn in a typical week? Please count only money that you can spend on whatever you want. Do not count money that is given to you to spend only on things like bus fare or lunch." Response categories included "None," "\$5 or less per week," "\$6–\$10 per week," "\$11 to \$25 per week," "\$26 to \$50 per week," "\$51 to \$75 per week," "\$76 to \$100 per week," "\$101 to \$125" and "More than \$125 a week." We used the midpoints of these categories and scaled the variable by dividing by 100.

Deviance—Six questions were used to create a deviance score. These questions were adapted from Jessor's Problem Behavior Theory (Jessor et al., 1991, Jessor and Jessor, 1977) and have been used in our previous studies with youths (Grube and Morgan, 1990). Youth were asked to indicate how many times in the past 12 months they had done each of the following: (1) lied to cover up something they did, (2) purposely damaged other people's property, (3) taken things from a store or shop without paying for them, (4) been in a fight where they hit or shoved someone, (5) skipped school without permission, and (6) used drugs to get high. Possible response options were, "Never (1)," "A few times (2)," "Several times (3)," and "Often (4)." A mean score was then computed, with a higher score indicating greater deviance. The internal reliability (Cronbach's α) for the six-item scale in the three survey waves ranged from .65 to .70.

Past year cigarette smoking—Respondents were asked if they ever smoked a whole cigarette in their life, more than just a few puffs ("No"/"Yes"). Respondents who responded affirmatively were asked about their frequency of cigarette smoking in the past 12 months on a seven-point scale ("Never" to "Every day"). Past-year cigarette smoking was treated as a dichotomous variable (i.e., past-year cigarette smoker versus non past-year cigarette smoker).

Youth demographics—Youths reported their gender, age, and race/ethnicity. Race/ethnicity was treated as a dichotomous variable (White non-Hispanic versus non-White). Youths were also asked to report the highest level of education their mother or female

guardian and father or male guardian had completed. Response categories included less than 8th grade, eighth grade, some high school, high school graduate or GED, technical, vocational, or trade school, some college, junior college graduate (A.A. or Associate's degree), college graduate (B.A. or B.S.—Bachelor's degree), and graduate or professional school after college (Master's, Ph.D., Lawyer, Doctor). These items were recoded into the number of years of education, and the highest reported education for either parent was used.

City demographics—Measures of city demographics were obtained from 2010 GeoLytics data (GeoLytics Inc, 2010). City demographics included population density (population per square mile), percent under 18 years old, and percent White and Hispanic. All these measures were standardized (z scored). Also, a socioeconomic status (SES) factor score was derived from median family income, percentage of population with a college education, and percentage of population unemployed. These three SES measures were significantly correlated ($r = .52-.79, p < .01$). Principal components analysis yielded a single-factor solution, accounting for 75.1% of the variance (factor loadings range: .78–.91). A higher SES score reflects higher city-level SES.

Data analysis

Analyses included youths who reported past-year alcohol drinking in at least one wave of data collection ($n=665$ individuals). Attrition analyses were conducted using the total study sample to determine whether youths who remained in the study were different from those who dropped off with respect to demographic characteristics and alcohol use at Wave 1. These analyses indicated that the percentage of male participants did not differ significantly across the three waves (range: 55.6–56.8%) nor did the percentage of whites (range: 58.9–59.7%). T-tests indicated that Wave 1 mean levels of past-year alcohol use frequency and continued volumes were similar among youths who did and did not participate in Wave 2 survey as well as among those who did and did not participate in Wave 3. Similarly, we examined whether youths who reported alcohol use in one wave were different from those who reported alcohol use in two or three waves of data collection. No differences in drinking patterns and percentage of males and whites were found.

To account for the nested design of the sample, we conducted multilevel logistic and Poisson regression analyses with HLM version 7.0 software (Raudenbush et al., 2011). Logistic regression analyses were used for dichotomous variables and Poisson regression analyses were used for count variables. Survey wave, overall alcohol frequency, continued volumes of use, weekly disposable income, deviance and any past-year cigarette smoking were included at the observation level (level 1). Youth gender, age at Wave 1, race/ethnicity and parent education at Wave 1 were included as non-time varying individual-level variables (level 2). City demographics were included as city-level variables in all models (level 3). The first set of analyses included past-year drinking in different contexts as outcomes and the second set used the number of drinking contexts used in the past year as the outcome. To investigate if different youths progress to drinking in different contexts at different rates across adolescence, the interactions survey wave by gender, survey wave by weekly disposable income, and survey wave by deviance were examined to determine whether they were predictive of outcome slopes. Interaction variables were standardized (z

scored). The interaction terms were dropped from the model if not statistically significant. Variables in each model were entered simultaneously. All observations with complete data for any specific model were included in the analysis.

Results

Descriptive statistics

Descriptive statistics for city-, individual-, and observation-level variables (by Wave) are provided in Table 1. Youths reported drinking most frequently at parties, followed by someone else's home, own home, outdoor places, restaurants/bars/nightclubs and school events. On average, youths used alcohol in two to three different drinking contexts in the past year. Among youths who reported past-year alcohol use, between 26.3% and 31.5% also reported any past-year cigarette smoking across the 3 waves. Over time, there was an increase in youth drinking at parties (75% in Wave 1, 79% in Wave 2 and 83% in Wave 3) and someone else's home (53% in Wave 1, 51% in Wave 2 and 62% in Wave 3) and there was a decrease in youth drinking in parking lots or street corners (26% in Wave 1, 26% in Wave 2 and 18% in Wave 3).

Drinking contexts

In multilevel models (Table 2) more frequent past-year alcohol use was associated with an increased likelihood of drinking at parties and at someone else's home. Specifically, each additional unit increase in past-year alcohol frequency was related to about a 330% increase in number of times the youths drank at parties and a 186% increase in the number of times they drank at someone else's home in the past year. Each additional unit increase in past-year continued volumes of alcohol use was associated with a 29% increase in the odds of drinking at parking lots or street corners.

General deviance was positively associated with drinking in most contexts (i.e., parties, someone else's home, own home, parking lots/street corners, beaches/parks and school events). Each additional unit increase in deviance score was associated with about 20% increase in number of times youths drank alcohol at parties and at someone else's home in the past year. This effect was greater for the other drinking contexts, with increases of 59%, 74%, 94% and 110% in odds of drinking in own home, school events, beaches or parks and parking lots or street corners, respectively. Past-year cigarette smoking was positively associated with drinking alcohol at someone else's home and at beaches or parks, such that cigarette smokers, compared with non-smokers, drank 68% more times at someone else's home and 44% more at beaches or parks.

Girls reported drinking at school events nearly 75% more than boys. They also reported drinking in parking lots or street corners 37% more than boys. Each additional year of age was associated with about 40% and 25% increase in number of times the youths drank at parties and at someone else's home, respectively. There was also a 53% increase in youths' odds of drinking at restaurants/bars/nightclubs for each additional year of age. Race, parental education and weekly disposable income were not associated with specific drinking contexts.

At the city level, a higher percent of whites was associated with a reduced likelihood of youth drinking in parking lots or street corners and increased likelihood of youth drinking at their own home. No other city demographics were associated with youths' drinking contexts.

Results of multilevel analyses to examine associations between youth individual characteristics and number of drinking contexts the youths used in the past year are in Table 3. Each additional year of age was associated with a 6% increase in the number of drinking contexts the youths used in the past year. Also, each additional unit increase in past-year continued volumes of alcohol use was associated with a 5% increase in the number of drinking contexts they used. There was a 23% increase in the number of drinking contexts the youths reported for each additional unit increase in deviance score. No other characteristics were associated with the number of drinking contexts used in the past year.

Changes in drinking contexts across time

The likelihood of youth drinking at parties and someone else's home increased over time, while the likelihood of drinking at parking lots or street corners decreased (Table 2). More specifically, each additional year was associated with a 38% increase in number of times they drank at parties and a 21% increase in the number of times they drank at someone else's home. Also, the likelihood of youth drinking at parking lots or street corners was reduced by about 20% in each additional year.

Statistically significant interactions were found between wave and deviance on drinking at own home, at beaches or parks and at restaurants/bars/nightclubs (see Table 2). These interactions indicated a greater progression to drinking in these contexts among deviant youths. Specifically, each additional unit increase in deviance was related to a 29% increase in drinking at own home in any additional year and a 26% increase in drinking at beaches or parks in any additional year. Similarly, there was a 40% increase in drinking at restaurants/bars/nightclubs each year for any additional unit increase in deviance score. No interactions were found between wave by gender and wave by weekly disposable income on all drinking context outcomes.

Discussion

Overall, the results of this study indicate that youths' drinking in different contexts is associated with distinct drinking patterns and with individual characteristics of youth drinkers. Moreover, these relationships change substantively over time and rates of change in drinking contexts are related to youth deviance. Greater likelihood of drinking outside the home (i.e., at parties and someone else's home) was evident over successive waves of the study as respondents aged. While frequent drinkers were found to drink in some contexts more often (i.e., parties and someone else's home), drinkers with higher deviance scores increased their likelihood of drinking in other contexts over waves (i.e., their own home, beaches or parks, and restaurants/bars/night clubs). We suggest that the redistribution of drinking contexts over the early life course may contribute to specific risks associated with different drinking contexts.

Older, more frequent drinkers were more likely to drink at parties and someone else's home. Parties are typically held in private settings, provide easy access to social sources of alcohol and may involve large numbers of people (Paschall et al., 2007, Wagenaar et al., 1993, Jones-Webb et al., 1997). Importantly, heavier drinking youths (i.e., youths who reported higher continued volumes) were not likely to drink in party contexts. In support of these results, a small exploratory study with Danish youths reported that drinkers indicated they do not need to drink a great amount of alcohol at parties in order to fit in with others (Frederiksen et al., 2012). These findings suggest that risks associated with drinking at parties may inhere in drinking in these contexts by different drinkers and less in how much they drink in those contexts. More research, however, is needed to examine specific risks associated with different drinking contexts among young people.

With the exception of restaurants/bars/night clubs, deviant youths were more likely to drink in all contexts. However, the relative associations of deviance with youth drinking contexts were quite different in magnitude from one context to another. The relationship of deviance to alcohol use at outdoor places (i.e., parking lots or street corners and beaches or parks) was large, 110% and 94% greater for every unit increase in deviance score. This relationship was more moderate for alcohol use in their own home (59%), at parties (22%) or someone else's home (19%). Moreover, over time, more deviant individuals increased their likelihood of drinking in some contexts much more rapidly than others. Specifically, over the course of the study, youth drinking in (1) own home, (2) beaches or parks and (3) restaurants/bars/nightclubs grew much faster for each unit increase in deviance (29%, 26%, and 40% per year respectively). These results suggest the importance of studying the divergent role that this and other psychosocial attributes play in different social-ecological environments and what contextual characteristics can moderate alcohol-related problems.

Cigarette smokers were more likely to drink at someone else's home. California's comprehensive smoke-free laws (American Lung Association in California, 2014) and the co-occurrence of alcohol use and cigarette smoking (Anthony and Echeagaray-Wagner, 2000, Barrett et al., 2006, Falk et al., 2006, Meyerhoff et al., 2006) may explain why cigarette smokers tend to drink at private places, such as someone else's home, as drinking contexts. Furthermore, results indicated that past year cigarette smokers were more likely to drink alcohol at beaches and parks but not parking lots or street corners. Although both are outdoor places, it is possible that beaches or parks, unlike parking lots or street corners, provide more convenient spaces for social and continuing drinking events and therefore for smoking while drinking. Results of this study suggest the importance of studying contexts that support co-use of tobacco, alcohol and other substances and associated risks.

Finally, the likelihood of drinking at parties and someone else's home increased over time, while the odds of drinking at parking lots or street corners decreased. Also, age was associated with drinking at restaurants/bars/night clubs and with increased number of drinking contexts the youth used. Increased mobility, autonomy and involvement in extended social networks that youth experience as they get older may explain these trends (Lerner and Steinberg, 2004, Wrzus et al., 2013). As youths get older, their mobility and extended social networks allow access to more contexts and events that involve larger numbers of people, reducing their need to drink at parking lots or street corners, contexts

that are probably more localized and involve fewer people. The expansion of drinking into more contexts during adolescence may expose youths to different risks related to drinking.

Results of this study are based on multilevel analyses using longitudinal data with very good follow-up rates. Moreover, attrition analyses showed that youths who remained in the study were not different from those who dropped off with respect to demographic characteristics and alcohol use. Yet, several limitations should be noted. First, our analyses considered only a handful of individual characteristics. Studying other characteristics, such as impulsivity or risk taking, will help us better understand youth selection of drinking contexts. Second, our data are drawn from mid-sized California cities, so study results are not necessarily representative of youth from rural or urban areas or other states. Third, our analyses considered drinking in only a small number of predetermined contexts. It is likely that there are other contexts where youths drink that were not included in this survey. Fourth, the causal relationships between some youth characteristics and drinking contexts remain ambiguous. For example, heavy drinking youth may preferentially select certain contexts for drinking, heavy drinking may be encouraged in those contexts, or both. Further study of these reciprocal influences is necessary. Finally, we had no data about specific social and situational characteristics of the drinking contexts and the temporal ordering of different contexts youths may attend across a given evening. Such data can enhance our understanding of the ways in which contextual characteristics may affect the self-selection process. Other research methods, such as ecological momentary assessment (EMA), may allow us to better capture the full range of drinking contexts, contextual characteristics, and movement across contexts.

Despite these limitations, results of this study suggest that youths differentially self-select themselves into different drinking contexts. This self-selection process may contribute to different risks across specific drinking contexts. For example, self-selection of heavy drinking youths into specific contexts may cause greater numbers of physiological problems to be associated with drinking in those contexts. However, more research is needed to examine specific risks, such as violence and hangovers, associated with certain types of drinking contexts among adolescents (Windle, 2003). Evidence for such associations to date is available primarily from research with adults and young adult college students.

The different drinker profiles identified for different drinking contexts supports the importance of developing context-based interventions to specific subgroups to prevent alcohol use and related negative outcomes. For example, interventions can be created with the goal of informing female students about risks associated with drinking at school events or targeting heavy drinking youths at outdoor places. To be efficient, such context-based interventions should integrate findings related to the distribution of drinking in particular contexts, specific risks associated with different drinking contexts, and the contribution of contextual characteristics to alcohol use and related problems among underage drinkers. To develop these interventions more research is needed to better understand the social mechanisms by which drinking contexts may affect alcohol use and related problems among youths (Freisthler et al., In Press).

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Table 1

Descriptive statistics for city-, individual-, and observation-level variables, by Wave

Variables	Percent	mean (SD)	Range
City level (N=50)			
Population density		4870.05 (3347.54)	1337.24–22330.15
Percent under 18 years old		23.74 (3.21)	17.04–30.03
Socioeconomic status ^a		.00 (1.00)	–1.73–1.71
Percent White		79.19 (14.53)	33.54–97.95
Percent Hispanic		34.17 (20.23)	8.20–97.43
Individual level (N=665)			
Age		14.93 (.95)	13–16
Male	55.5		
White non-Hispanic	59.4		
Parental education		15.84 (2.00)	6–18
Observation level			
<u>Wave 1 (N=289 past-year alcohol users)</u>			
Past-year alcohol use frequency ^b		.09 (.10)	.01–2.00
Past-year continued volume ^b		.27 (.75)	.00–7.56
Past-year alcohol use at:			
Parties	75	4.63 (10.86)	0–100
Someone else's home	53	3.10 (9.60)	0–99
Own home	40	1.01 (2.40)	0–20
Parking lots or street corners	26	1.70 (6.25)	0–60
Beaches or parks	29	1.19 (4.30)	0–50
Restaurants, bars or nightclubs	12	.25 (1.03)	0–12
School events	9	.19 (1.26)	0–20
Past-year number of drinking contexts		2.43 (1.53)	0–7
Weekly spending money ^b		.18 (.22)	.00–1.25
Deviance		1.64 (.50)	1–3.33
Any past-year cigarette smoking	31.5		
<u>Wave 2 (N=402 past-year alcohol users)</u>			
Past-year alcohol use frequency ^b		.13 (.33)	.01–3.65
Past-year continued volume ^b		.37 (.97)	.00–8.52
Past-year alcohol use at:			
Parties	79	5.95 (11.67)	0–104
Someone else's home	51	3.13 (8.22)	0–104
Own home	38	1.52 (5.54)	0–80
Parking lots or street corners	26	1.51 (5.38)	0–56
Beaches or parks	28	1.44 (4.57)	0–40
Restaurants, bars or nightclubs	9	.23 (1.00)	0–10
School events	10	.24 (.99)	0–10

Variables	Percent	mean (SD)	Range
Past-year number of drinking contexts		2.41 (1.49)	0–6
Weekly spending money ^b		.23 (.31)	.00–1.25
Deviance		1.62 (.49)	1–3.33
Any past-year cigarette smoking	28.6		
<u>Wave 3 (N=472 past-year alcohol users)</u>			
Past-year alcohol use frequency ^b		.17 (.34)	.01–3.65
Past-year continued volume ^b		.49 (1.15)	.00–11.44
Past-year alcohol use at:			
Parties	83	7.11 (15.77)	0–150
Someone else's home	62	3.57 (8.21)	0–70
Own home	35	1.25 (3.79)	0–60
Parking lots or street corners	18	1.07 (6.24)	0–100
Beaches or parks	26	1.06 (5.10)	0–90
Restaurants, bars or nightclubs	13	.55 (2.95)	0–50
School events	9	.24 (1.33)	0–20
Past-year number of drinking contexts		2.43 (1.46)	0–7
Weekly spending money ^b		.38 (.43)	.00–1.25
Deviance		1.57 (.46)	1–3.67
Any past-year cigarette smoking	26.3		

^a Measured as a factor score derived from: median household income, percentage of population with a college education, and percentage of population unemployed.

^b Variable rescaled by dividing values by 100

Table 2
Results of multilevel analyses to examine the associations between drinking contexts and city and individual characteristics

	Parties		Someone else's home		Own home		Parking lots or street corners		Beaches or parks		Restaurants, bars or nightclubs		School events		
	Event Rate Ratio (CIs)		Event Rate Ratio (CIs)		OR (CIs)		OR (CIs)		OR (CIs)		OR (CIs)		OR (CIs)		
Observation Level															
Wave	1.38 (1.21, 1.59)**		1.21 (1.02, 1.44)*		.81 (.67, .97)*		.80 (.66, .96)*		.88 (.73, 1.06)		.96 (.72, 1.29)		1.03 (.78, 1.37)		
F	4.31 (2.28, 8.16)**		2.86 (1.20, 6.81)*		1.41 (.71, 2.79)		1.44 (.73, 2.85)		1.37 (.61, 3.12)		1.46 (.84, 2.54)		1.14 (.51, 2.52)		
V-F	1.09 (.97, 1.23)		1.08 (.85, 1.37)		1.28 (.96, 1.72)		1.29 (1.06, 1.59)*		1.31 (.99, 1.74)		1.16 (.94, 1.43)		1.28 (.95, 1.73)		
Weekly spending money	.76 (.57, 1.02)		.95 (.72, 1.24)		.76 (.50, 1.18)		.74 (.43, 1.30)		1.17 (.75, 1.82)		1.55 (.99, 2.43)		1.61 (.86, 3.00)		
Deviance	1.22 (1.10, 1.40)**		1.19 (1.00, 1.41)*		1.59 (1.33, 1.91)**		2.10 (1.81, 2.44)**		1.94 (1.62, 2.35)**		1.14 (.89, 1.48)		1.74 (1.37, 2.21)**		
Wave X Deviance	---		---		1.29(1.09, 1.52)**		---		1.26(1.05, 1.53)*		1.40(1.16, 1.69)**		---		
Any past year smoking	1.34 (.92, 1.96)		1.68 (1.09, 2.61)*		1.32 (.95, 1.83)		1.15 (.83, 1.60)		1.44 (1.06, 1.94)*		.80 (.45, 1.40)		1.17 (.66, 2.11)		
Individual Level															
Female	1.09 (.93, 1.27)		.88 (.69, 1.13)		.93 (.69, 1.27)		1.37 (1.00, 1.89)*		1.23 (.87, 1.74)		1.28 (.84, 1.95)		1.74 (1.04, 2.93)*		
Age	1.41 (1.25, 1.59)**		1.25 (1.07, 1.46)**		.88 (.72, 1.07)		.89 (.74, 1.09)		1.07 (.88, 1.31)		1.53 (1.14, 2.06)**		1.05 (.81, 1.37)		
White	.86 (.72, 1.04)		.94 (.77, 1.15)		1.29 (.97, 1.72)		1.14 (.77, 1.70)		.75 (.50, 1.13)		.79 (.48, 1.30)		1.02 (.58, 1.79)		
Parental education	1.04 (1.00, 1.09)		1.02 (.97, 1.08)		1.00 (.94, 1.07)		.96 (.88, 1.05)		.94 (.87, 1.02)		1.12 (.99, 1.27)		1.00 (.88, 1.12)		
City Level															
Population density	.99 (.89, 1.11)		.99 (.85, 1.15)		.96 (.80, 1.15)		.95 (.76, 1.18)		1.06 (.90, 1.25)		1.27 (.95, 1.69)		1.11 (.81, 1.51)		
Percent minors	.91 (.77, 1.07)		1.03 (.85, 1.25)		1.16 (.91, 1.47)		.84 (.63, 1.13)		1.01 (.77, 1.33)		.83 (.55, 1.23)		.96 (.64, 1.43)		
SES	1.07 (.96, 1.19)		1.11 (.95, 1.29)		1.10 (.91, 1.34)		1.10 (.88, 1.38)		1.18 (.92, 1.53)		1.31 (.98, 1.76)		.84 (.64, 1.09)		
Percent Whites	1.02 (.92, 1.12)		1.05 (.94, 1.17)		1.16 (1.03, 1.30)*		.81 (.70, .94)*		1.13 (.98, 1.32)		.90 (.72, 1.14)		.90 (.71, 1.14)		
Percent Hispanics	1.10 (.95, 1.26)		.91 (.69, 1.19)		1.00 (.73, 1.36)		1.20 (.80, 1.79)		.88 (.68, 1.15)		1.09 (.80, 1.48)		.77 (.45, 1.31)		

* .05;

** .005

Table 3

Results of multilevel Poisson model to examine the associations between number of drinking contexts in the past year and city and individual characteristics

Number of drinking contexts	
Observation Level	
Wave	1.02 (.98, 1.07)
F	1.13 (.96, 1.32)
V-F	1.05 (1.01, 1.10)*
Spending money	1.05 (.96, 1.16)
Deviance	1.23 (1.19, 1.27)**
Any past year smoking	1.07 (1.00, 1.16)
Individual Level	
Gender	1.07 (.99, 1.15)
Age	1.06 (1.00, 1.10)*
White	.97 (.90, 1.04)
Parent education	.99 (.98, 1.02)
City Level	
Population density	1.00 (.96, 1.04)
Percent minors	1.00 (.94, 1.04)
SES	1.04 (1.00, 1.08)
Percent Whites	1.00 (.98, 1.03)
Percent Hispanics	1.00 (.96, 1.06)

* .05;

** .005